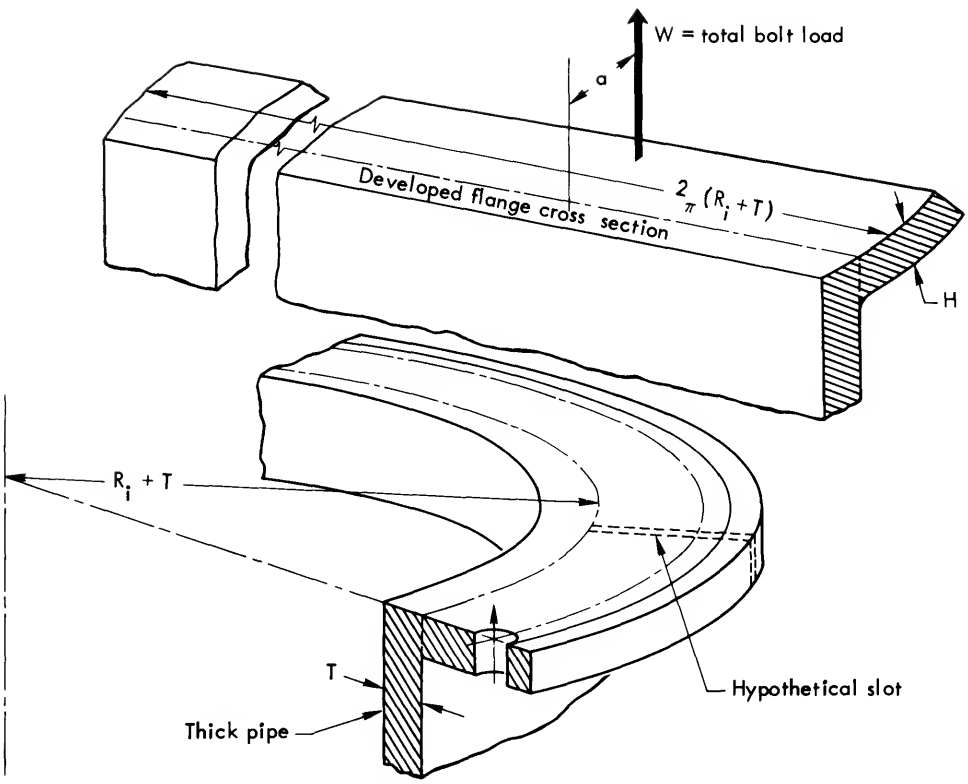

Fig. 33.2 Flange clamped circumferentially as a cantilever.

The maximum stress in the pipe, using this theory and adhering to the notation in Fig. 33.3, becomes

$$S_b = \frac{6M_0}{T^2} \tag{33.4}$$

where

$$M_0 = \frac{W_i(R_o - R_i)}{1 + \frac{\beta_s H}{2} + \frac{1-\mu^2}{2\beta_s R_i}\left(\frac{H}{T}\right)^3 \log_e\left(\frac{R_o}{R_i}\right)} \tag{33.5}$$

the corresponding shear force is

$$Q_0 = \beta_s M_o \tag{33.6}$$

where

$$\beta_s = \frac{1.285}{(R_i T)^{1/2}} \tag{33.7}$$